

ABSTRACT OF THE DISCLOSURE

A device for efficient propagation of radio frequency (RF) signals, including concurrent transmission of signals of different polarizations, includes a waveguide having an input port for receiving electromagnetic radiation having a first polarized signal and a second polarized signal, the first and second polarized signals being orthogonal to one another. The waveguide includes first and second substrates mounted therein and positioned transverse to the longitudinal axis thereof. Both the first and second substrates are substantially transmissive of the electromagnetic radiation. The first substrate includes a probe formed thereon for transmitting or receiving the first polarized signal, and the second substrate includes a probe for transmitting or receiving a second polarized signal. A grid substrate is mounted in the waveguide between the first and second substrates and positioned transverse to the longitudinal axis thereof. The grid substrate includes a multiplicity of metallic lines disposed in a spaced apart relation and oriented to be reflective of the first polarized signal and transmissive of the second polarized signal.